

## VOICE SIGNATURE TRANSACTION SYSTEM AND METHOD

[0001]

### FIELD OF THE INVENTION

The present invention relates to a transaction system and a  
5 transaction method in which a product or service transaction is  
conducted by a user terminal used by a user, a server used by a product  
or service server, and a data network connecting the user and the server.  
More particularly, the present invention relates to a transaction system  
and a transaction method in which a signature is added to a user's  
10 (customer's) order through a plurality of voice data units.

[0002]

### BACKGROUND OF THE INVENTION

To prevent a user's (customer's) rejection of payment and  
non-recognition of an order, the technology for adding a user's digital  
15 signature to an order is used today in an electronic commerce on the  
Internet.

[0003]

A private key stored, for example, in a smart card is used as a  
digital signature. However, using such a private key as a digital  
20 signature requires the user terminal to have a special unit such as a  
smart card reader.

[0004]

Also, electronic commerce on the Internet is increasingly  
targeted not only at personal computers but also at cellular phones.

25 [0005]

## SUMMARY OF THE DISCLOSURE

However, the conventional technology has the problems described below. That is, as cellular phones become more popular and the volume of electronic commerce rapidly increases, the problem of user's rejection of payment or the non-recognition of orders occurs more frequently. This is because using a conventional digital signature through the use of a smart card requires a user terminal to have a special unit. However, it is not practical for cellular phones, which are widely used today, to have such a special unit.

10 [0006]

It is a first object of the present invention to provide a voice signature transaction system and a voice signature transaction method capable of preventing troubles involved in electronic commerce on cellular phones such as the user's (customer's) rejection of payment or non-recognition of an order.

15 [0007]

It is a second object of the present invention to provide a voice signature transaction system and a voice signature transaction method that do not require a user's terminal to have a special unit.

20 [0008]

According to a first aspect of the present invention, there is provided a voice signature transaction system comprising a user terminal used by a user, a server used by a person providing products or services, and a data network connecting the user terminal and the server for conducting a product or service transaction, wherein (A) the user

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terminal comprises a voice input unit for inputting voice data, and wherein (B) the server comprises a sending/receiving unit, an allocating unit, a storage unit, and a checking unit, wherein (B1) the sending/receiving unit (B11) sends product and service transaction

5 information to the user terminal when accessed by the user terminal, (B12) receives order data including data on a product or a service and a user name, the product or service being specified on the user terminal receiving the transaction information and being specified from products and services included in the transaction information, (B13) sends order

10 ID request information to the user terminal, the order ID request information requesting a signature of an order ID of the order data via voice, the order ID being allocated by the allocating unit in response to the order data, (B14) receives order ID voice data that is input, via voice, on the user terminal receiving the order ID request information, (B15)

15 sends name request information to the user terminal when the order ID included in the received order ID voice data matches the allocated order ID, the name request information requesting to input, via voice, a signature of a name of a user who has placed the order, (B16) receives name voice data that is input, via voice, on the user terminal receiving

20 the name request information, and (B17) sends acceptance information to the user terminal when the name included in the received name voice data matches the name included in the order data, the acceptance information indicating that the order data, the order ID voice data, and the name voice data have been accepted, wherein (B2) the allocating unit

25 allocates the order ID to the order data, wherein (B3) the storage unit

stores the order data as well as the order ID voice data and the name voice data that are related to the order data and stores the transaction information, and wherein (B4) the checking unit (B41) checks if the order ID included in the received order ID voice data matches the allocated order ID, and (B42) checks if the name included in the received name voice data matches the name included in the order data.

[0009]

Preferably, in the voice signature transaction system, (B1) the sending/receiving unit of the server further sends date/time request information to the user terminal when the name included in the received name voice data matches the name included in the order data, the date/time request information requesting to input, via voice, an order date/time, and receives date/time voice data that is input, via voice, on the user terminal receiving the date/time request information, and (B3) the storage unit of the server further stores the date/time voice data related to the order data.

[0010]

Preferably, in the voice signature transaction system, (B4) the checking unit of the server further checks if a voiceprint of the received order ID voice data matches a voiceprint of the received name voice data and/or date/time voice data, and (B1) the sending/receiving unit of the server further sends the acceptance information to the user terminal when the voiceprint of the received order ID voice data matches the voiceprint of the received name voice data and/or date/time voice data.

[0011]

Preferably, in the voice signature transaction system, the sending/receiving unit of the server sends the order ID request information or the name request information again when the checking unit did not find a match in the order IDs, in the names, or in the voiceprints; and information indicating that the order data is not accepted when the checking unit did not find a match in the order IDs, in the names, or in the voiceprints after the order ID request information or the name request information is sent a specified number of times.

[0012]

10 Preferably, in the voice signature transaction system, the server further comprises output unit for outputting a voice of the voice signature data stored in the storage unit.

[0013]

15 Preferably, in the voice signature transaction system, the user terminal is a cellular phone and the data network includes a wireless base station capable of making a wireless connection to the cellular phone.

[0014]

20 According to a second aspect of the present invention, there is provided a voice signature transaction method for use in a system comprising a user terminal used by a user, a server used by a person providing products or services, and a data network connecting the user terminal and the server for conducting a product or service transaction, the method comprising the steps by the server of sending product and  
25 service transaction information to the user terminal when accessed by

the user terminal; receiving order data including data on a product or a service and a user name, the product or service being specified on the user terminal receiving the transaction information and being specified from products and services included in the transaction information;

5 storing the received order data; allocating an order ID to the order data in response to the order data; sending order ID request information to the user terminal, the order ID request information requesting a signature of the order ID of the order data via voice; receiving order ID voice data that is input, via voice, on the user terminal receiving the

10 order ID request information; storing the order ID voice data related to the order data; checking if the received order ID voice data matches the allocated order ID; sending name request information to the user terminal when the order ID included in the received order ID voice data matches the allocated order ID, the name request information requesting

15 to input, via voice, a signature of a name of a user who has placed the order; receiving name voice data that is input, via voice, on the user terminal receiving the name request information; checking if the name included in the received name voice data matches the name included in the order data; and sending acceptance information to the user terminal

20 when the name included in the received name voice data matches the name included in the order data, the acceptance information indicating that the order data, the order ID voice data, and the name voice data have been accepted.

[0015]

25 According to a third aspect of the present invention, there is

provided a computer-readable program for use in a system comprising a user terminal used by a user, a server used by a person providing products or services, and a data network connecting the user terminal and the server for conducting a product or service transaction, the

5 program causing the server to send product and service transaction information to the user terminal when accessed by the user terminal; receive order data including data on a product or a service and a user name, the product or service being specified on the user terminal receiving the transaction information and being specified from products

10 and services included in the transaction information; store the received order data; allocate an order ID to the order data in response to the order data; send order ID request information to the user terminal, the order ID request information requesting a signature of the order ID of the order data via voice; receive order ID voice data that is input, via voice,

15 on the user terminal receiving the order ID request information; store the order ID voice data related to the order data; check if the received order ID voice data matches the allocated order ID; send name request information to the user terminal when the order ID included in the received order ID voice data matches the allocated order ID, the name

20 request information requesting to input, via voice, a signature of a name of a user who has placed the order; receive name voice data that is input, via voice, on the user terminal receiving the name request information; check if the name included in the received name voice data matches the name included in the order data; and send acceptance information to the

25 user terminal when the name included in the received name voice data

matches the name included in the order data, the acceptance information indicating that the order data, the order ID voice data, and the name voice data have been accepted.

The program may be carried on or stored by a medium, which is  
 5 computer-readable. The medium may be static or dynamic, the latter comprising, e. g., also a carrier wave or transmission system in general. e. g., a communication network system.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram schematically showing the  
 10 configuration of a voice signature transaction system in an embodiment of the present invention.

FIG. 2 is a flowchart showing the operation of the voice signature transaction system in the embodiment of the present invention.

FIG. 3 is a diagram schematically showing the contents saved  
 15 in a server of the voice signature transaction system in the embodiment of the present invention.

[0016]

#### PREFERRED EMBODIMENTS OF THE INVENTION

A voice signature transaction system comprises a user terminal  
 20 used by a user, a server used by a person providing products or services, and a data network connecting the user terminal and the server for conducting a product or service transaction, wherein (A) the user terminal comprises voice input unit for inputting voice data, and wherein (B) the server comprises sending/receiving unit, allocating unit,  
 25 storage unit, and checking unit, wherein (B1) the sending/receiving unit



(B11) sends product and service transaction information to the user terminal when accessed by the user terminal, (B12) receives order data including data on a product or a service and a user name, the product or service being specified on the user terminal receiving the transaction information and being specified from products and services included in the transaction information, (B13) sends order ID request information to the user terminal, the order ID request information requesting a signature of an order ID of the order data via voice, the order ID being allocated by the allocating unit in response to the order data, (B14) receives order ID voice data that is input, via voice, on the user terminal receiving the order ID request information, (B15) sends name request information to the user terminal when the order ID included in the received order ID voice data matches the allocated order ID, the name request information requesting to input, via voice, a signature of a name of a user who has placed the order, (B16) receives name voice data that is input, via voice, on the user terminal receiving the name request information, and (B17) sends acceptance information to the user terminal when the name included in the received name voice data matches the name included in the order data, the acceptance information indicating that the order data, the order ID voice data, and the name voice data have been accepted, wherein (B2) the allocating unit allocates the order ID to the order data, wherein (B3) the storage unit stores the order data as well as the order ID voice data and the name voice data that are related to the order data and stores the transaction information, and wherein (B4) the checking unit (B41) checks if the

order ID included in the received order ID voice data matches the allocated order ID, and (B42) checks if the name included in the received name voice data matches the name included in the order data. If, after the person providing products or services processes the order, the user (customer) rejects to pay or does not recognize that he or she has placed the order, the voice data saved in the server as the user signature may be reproduced to request the user to confirm the order. If the user still rejects to pay, the person providing products or services may use a voiceprint analyzer, as necessary, to analyze the voiceprint of the voice data saved in the server or ask a specialist to check the voiceprint.

[0017]

An embodiment of the present invention will now be described with reference to the drawings. FIG. 1 is a block diagram schematically showing the configuration of a voice signature transaction system in an embodiment of the present invention. The voice signature transaction system comprises a user terminal 10, a server 20, and a communication network 30.

[0018]

The user terminal 10, a terminal used by a user who is a customer, is a cellular phone, a portable data terminal, a personal computer, etc., connected to a communication network such as the Internet. This user terminal comprises sending/receiving unit 11, display unit 12, key entry unit 13, voice input unit 14, and storage unit 15.

[0019]

The sending/receiving unit 11 sends or receives data to or from the server 20 over the communication network 30 that is wired or wireless. Data that is sent or received includes (1) data required to  
 5 access the server 20, (2) web page data sent from the server 20, (3) data on a product or a service ordered through a web page, (4) signature request data sent from the server 20 in response to an order (5) data required for a signature such as an order ID, name, order date/time, and  
 (6) order acceptance data. The display unit 12 displays web pages sent  
 10 from the server 20 or data output from the browser. The key entry unit 13 allows the user, through the key buttons (keyboard), to enter or select (order) a product or a service provided on the communication network 30 by the server 20. The voice input unit 14 allows the user to input, via voice, data necessary for a signature such as an order ID, name,  
 15 order date/time, and so on, required by the server 20. The storage unit 15 stores data that is received and sent.

[0020]

The server 20, a data processing unit such as a server, accepts a product or service request on the communication network 30. It  
 20 comprises sending/receiving unit 21, allocating unit 22, storage unit 23, output unit 24, and checking unit 25.

[0021]

The sending/receiving unit 21 sends or receives data to or from the user terminal 10 over the communication network 30. Data  
 25 includes (1) web page data, (2) data on an order sent from the user

terminal 10, (3) signature request data sent to the user terminal 10 such as an order ID, name, order date/time, and so on, (4) signature data sent from the user terminal 10 that is required for a signature such as an order ID, name, order date/time, and so on, and (5) order acceptance data. The allocating unit 22 allocates an order ID to an order sent from the user terminal 10. The storage unit 23 is used by the server 20 to store (save) received voice data composed of order data, an order ID, and a user signature that are received from the user (customer) and that are related each other. The output unit 24 outputs data for executing processing when an order has been accepted. The checking unit 25 checks whether a plurality of voiceprints entered by a user as a signature match or whether the character-input contents match the voice-input contents.

[0022]

The communication network 30 is a network, such as the Internet, that connects the user terminal 10 and the server 20. When the user terminal 10 is a cellular phone, the communication network 30 includes base stations.

[0023]

Next, the operation of the embodiment will be described with reference to the drawings. FIG. 2 is a flowchart showing the operation of a voice signature transaction system used in the embodiment of the present invention. FIG. 3 is a diagram schematically showing the contents that are saved in the server of the voice signature transaction system in the embodiment of the present invention. In the description

described below, it is assumed that the user terminal 10 is a cellular phone and that the communication network 30 is the Internet.

[0024]

Referring to FIG. 2, the user uses the cellular phone 10 to access a product/service order web page on the Internet 30 provided by the server 20. Then, the user specifies a product or a service through voice or keys and sends specified data (place an order) (step A1).

[0025]

The server 20 receives order data from the user (customer) (step A2), allocates an order ID that uniquely identifies the received order data (step A3), and saves a combination of the order ID and the order data (step A4). The order data includes information on the product or service the user ordered as well as user identification information such as the user name, address, contact location, contact method, and so on (see order data in FIG. 3).

[0026]

The server 20 sends the order ID, allocated to the user's order, to the cellular phone 10 via voice or screen display (step A5) and requests the user to enter the order ID as a signature via voice. For example, when '012345' is allocated as the order ID, the order ID '012345' is sent from the server 20 to the cellular phone 10 in step A5 as voice data or display data.

[0027]

The user receives the order ID via the cellular phone 10 (step A6) and reads the order ID aloud to send the voice data of the order ID

back to the server 20 (step A7). In step A7, the voice data read aloud by the user as 'zero one two three four five' is sent from the cellular phone 10 to the server 20 over the Internet 30.

[0028]

5 In response to the voice data of the order ID from the cellular phone 10, the server 20 saves the voice data for later use as a part of the user's signature (step A8). This voice data is related to the saved order data before being saved. At this time, a check is made to see if the allocated order ID matches the order ID of the voice data. If they  
10 match, control is passed to the next step. If they do not match, the user is requested to send the voice data of the order ID again. If the allocated order ID does not match the order ID of the voice data after several attempts, the order is rejected.

[0029]

15 The server 20 sends the name of the user, who placed the order, to the cellular phone 10 as voice data or display data (step A9) to request the user to enter the signature of the name via voice. For example, when the user name is 'Azuma Tomihiko', the name 'Azuma Tomihiko' is sent from the server 20 to the cellular phone 10 as display  
20 data in step A9. When the server 20 sends the name to the cellular phone 10 via voice in step A9, the pronounced name 'Azuma Tomihiko' is used.

[0030]

When the user receives the name via the cellular phone 10 (step  
25 A10), he or she reads his or her own name aloud to send voice data of the

name to the server 20 (step A11). In step A11, the pronounced voice data 'Azuma Tomihiko' is sent from the cellular phone 10 to the server 20 via the Internet 30.

[0031]

5 In response to the voice data of the user name from the cellular phone 10, the server 20 saves the voice data for later use as a part of the user signature (step A12). This voice data is related to the order data in step A12 before being saved. In this step, a check is made to see if the name included in the order data matches the name included in the voice data. If they match, control is passed to the next step. If they do not match, the server 20 requests the user to send the voice data of the name again. If the name included in the order data does not match the name included in the voice data after several attempts, the order is rejected. Alternatively, a check may be made to see if the voiceprint of the voice data of the order ID matches the voiceprint of the voice data of the name. In this case, if the two voiceprints do not match, the order is rejected.

[0032]

20 The server 20 sends the user order acceptance date/time to the cellular phone 10 as voice data or display data (step A13) to request the user to input the voice data of the order date/time as a signature. For example, when the order date/time is '32 minutes and 11 seconds past 8 on March 6, 2000', the order date/time of '32 minutes and 11 seconds past 8 on March 6, 2000' is sent from the server 20 to the cellular phone 10 as voice data or display data.

[0033]

Upon receiving the order date/time by the cellular phone 10 (step A14), the user reads the order date/time aloud to send the voice data of the order date/time back to the server 20 (step A15). For example, in step A15, the voice data pronounced by the user as 'thirty-two minutes and eleven seconds past eight on March sixth two-thousand' is sent from the cellular phone 10 to the server 20 via the Internet 30.

[0034]

In response to the voice data of the order date/time from the cellular phone 10, the server 20 saves the voice data for use as a part of the user signature (step A16). This voice data is related to the order data and is saved in step A16. In this step, a check may also be made to see if the voiceprint of the voice data of the order ID matches the voiceprint of the voice data of the date/time. In this case, if the two voiceprints do not match, the order is rejected

[0035]

When all data required for adding the signature to the order is obtained from the user and the obtained data is found valid, the server 20 sends voice data or display data to the cellular phone 10 indicating that the order from the user has been accepted (step A17) and starts processing the order from the user (step A19).

[0036]

Upon receiving the voice data or display data via the cellular phone 10 indicating that the order has been accepted, the user learns that the order has been accepted correctly (step A18). Although the order



ID, name, and order date/time are used as the user signature data in the above example, other data may also be used as the signature. Data that may be read aloud by the user via the cellular phone 10 may be used as signature data.

5 [0037]

FIG. 3 is a diagram showing how order data is related to user signature data when saved. This order data indicates that '012345' is allocated as the order ID and that '100 binders' and '200 boxes of A4-size paper' are ordered from the user (customer) named 'Azuma

10 Tomihiko'

[0038]

Order data and customer signature data are related by the order ID that uniquely identifies the order. The order ID, name, and order date/time are used as the signature data of the customer.

15 [0039]

The order ID is saved as a combination of the character data '012345', which represents the order ID, and 'file 1' which is the name of the file in which the voice data pronounced 'zero one two three four five' is stored.

20 [0040]

The name is saved as a combination of the character data 'Azuma Tomihiko', which represents the name, and 'file 2' which is the name of the file in which the voice data pronounced 'Azuma Tomihiko' is stored.

25 [0041]

The order date/time is saved as a combination of the character data '32 minutes and 11 seconds past 8 on March 6, 2000', which represents the order date/time, and 'file 3' which is the name of the file in which the voice data pronounced 'thirty-two minutes and eleven seconds past eight on March sixth two-thousand' is stored.

[0042]

If, after the server 20 processes the order, the user (customer) rejects to pay or does not recognize that he or she has placed the order, the server 20 reproduces the voice data in FIG. 3, saved as the user signature, to request the user to confirm the order. If the user still rejects to pay, the server 20 uses a voiceprint analyzer to analyze the voiceprint as necessary. If the result is suspicious, the server 20 asks a specialist to check the voiceprint of the voice data in FIG. 3 to prove that the user has placed the order and requests the user to pay.

[0043]

The meritorious effects of the present invention are summarized as follows.

The system according to the present invention allows the user to add a signature to an order without having to install a special unit on the user terminal. The present invention is particularly useful in electronic commerce targeting rapidly spreading cellular phones or portable terminals, because a variety of phone types are available and a huge number of phones have already been shipped.

[0044]

The reason is that voice is used as the method for adding a

signature. A signature is produced by voice data generated by the user (customer) reading aloud the characters or numbers sent from the server. Therefore, any user terminal with a voice input mechanism, such as a cellular phone, could allow the user to add a signature. In addition, voice identifies individuals through voiceprint analysis and so on, making the signature highly reliable.

It should be noted that other objects, features and aspects of the present invention will become apparent in the entire disclosure and that modifications may be done without departing the gist and scope of the present invention as disclosed herein and claimed as appended herewith.

Also it should be noted that any combination of the disclosed and/or claimed elements, matters and/or items may fall under the modifications aforementioned.